LVIII.—*A Revision of the Species of Butterflies belonging to the Genus* Teracolus, *Swains.* By Arthur G. Butler, Ph.D., F.L.S., F.Z.S., &c.

[Concluded from p. 473.]

67. *Teracolus Hildebrandti.*

Callosune Hildebrandti, Staudinger, Exot. Schmett. p. 45, pl. xxiii. (1886).

From Nyasaland northward to Uganda and eastward to Mombasa.

This species is certainly dimorphic in its wet and dry phases, having the apical patch on the primaries either dull ochreous or bright crimson; it is very closely related to the southern *T. Annæ*, but is, generally speaking, a slightly larger insect with a little less black about it, the female of the wet-season form clearer and more cream-tinted on the under surface of the secondaries. At the same time its dimorphic character is its best one, the crimson-tipped forms (especially the males) of the two butterflies being remarkably similar in every respect. It is curious that just when Mr. Marshall was stating that this species had "only been received from the basin of the Sabaki River," we were receiving a male of the dry-season form from Nyasa, completely proving the specific identity of this species with the crimson-tipped representative of *T. Annæ*, four examples of which from Nyasa stand in the Hewitson series, whilst the Godman and Salvin collection contained seven now transferred to the Museum series. An example of the dry-season form of this variety is recorded by Mr. Marshall in a footnote as *T. Annæ*; yet he professes to distinguish the two species partly by the black inner edging to the apical patch—a very unreliable character, which varies considerably in *T. Annæ* itself.

68. *Teracolus Annæ.*

Thestias Annæ, Wallengren, Kongl. Svensk. Vetensk.-Akad. Handl. 1857; Lep. Rhop. Caffr. p. 66.

Anthocharis Danae, Hewitson (nec Fabr.), Gen. Diurn. Lep. pl. vii. fig. 3 (1847).

Teracolus cinerascens, Butler, Cist. Ent. i. p. 172 (1873).

Teracolus Wallengreni, Butler, P. Z. S. 1876, p. 157.

Callosune Wallengreni, Westwood, in Oates's Matabeleland, p. 341, pl. E. figs. 3, 4 (1881).

Callosune confusa, Westwood, *l. c.* p. 348 (1889).

Ranges from Natal to the Zambesi.

In its wet-season form this is the most heavily marked of all the crimson-tipped *Teracoli*. This form is the typical one, and was named by me as *T. cinerascens* in consequence of Pastor Wallengren's error in describing it as a *Thestias*; *T. Wallengreni=confusa* is the dry-season form; an intermediate form also occurs.

69. *Teracolus Walkeri*.

Teracolus Walkeri, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. xiv. p. 403 (1884).

Elephant Bay, S.W. Africa.

This very distinct butterfly was obtained by Mr. J. J. Walker, R.N., about the year 1883. This ardent collector and enthusiastic entomologist appears only to have been able to secure dry and intermediate phases of the species.

T. Walkeri is, in some respects, intermediate in character between *T. Annæ* and *T. pseudacaste*, the primaries of the male above somewhat resembling the wet-season form of *T. Annæ*, but the secondaries, from their less heavily spotted border, perhaps approaching nearer to *T. pseudacaste*; on the whole, however, *T. Walkeri* is far nearer to *T. Hildebrandti* and *Annæ* than to *T. pseudacaste* and *eupompe*.

70. *Teracolus pseudacaste*.

Teracolus pseudacaste, Butler, P. Z. S. 1876, p. 156, pl. vi. fig. 11.
Teracolus phœnius, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 488 (1876).
Teracolus miles, Butler, *op. cit.* ser. 5, vol. xii. p. 105 (1883).

Ranges from the White Nile and Abyssinia southwards to Kilima-njaro.

My three supposed species were all based upon wet-season examples, *T. pseudacaste* being based upon examples obtained on the White Nile probably just after the rainy season, the male lightly but the female heavily marked with black above. *T. phœnius* and *T. miles* are both typical wet-season forms, the former being more heavily marked with black on both surfaces than the latter and showing less crimson in the apical patch, the lowest spot of which is extremely small. The black veining below is sometimes very heavy, especially in females of the wet-season phase, but in the intermediate phase it almost disappears, though in this species the ends of the veins are always blackened in all the phases.

Although the wet-season form of this butterfly and of the allied *T. eupompe* appear to occur together to the north of their range, they differ so markedly in all their phases that I

should no more regard them as synonymous (as Mr. Marshall has done) than I should *Ganoris brassicæ* and *rapæ*. *T. pseudacaste* ranges due southwards, whereas *T. eupompe* appears to follow the north-eastern coast, crossing over from Somaliland to Aden.

71. *Teracolus eupompe.*

Pontia eupompe, Klug, Symb. Phys., Ins. pl. vi. figs. 11–14 (1829).
Anthopsyche theopompe, Felder, Reise der Nov., Lep. ii. p. 183 (1865).
Anthopsyche anteupompe, Felder. *t. c.* p. 184 (1865).
Anthopsyche dedecora, Felder, *ibid.*

Ranges from the White Nile and Abyssinia south-eastwards to Somaliland, and thence across the straits to Aden.

This species in all its phases can easily be distinguished from *T. pseudacaste* by the great reduction of all the black markings on the under surface of the wings, the subapical spots on the primaries and the discal spots crossing the secondaries being almost or wholly obliterated, whilst the red subapical stripe and the red discal spots on the under surface of the secondaries in the female are strongly emphasized. The wet-season form is *T. eupompe*=*anteupompe*; the intermediate phase is *T. theopompe*, having a dry-season upper surface, but a white under surface; whilst *T. dedecora*, in which the apex of primaries and the secondaries below are rosy, is the dry-season phase. The two latter undoubtedly fly together, and in Aden it is tolerably certain that all the phases emerge at the same time as mere variations, which only become seasonally fixed in a more variable climate.

72. *Teracolus dulcis.*

Teracolus dulcis, Butler, P. Z. S. 1876, p. 157, pl. vii. fig. 13.
Teracolus dirus, Butler, *t. c.* pl. vii. fig. 11.
Teracolus eborcoides, Butler, *t. c.* p. 158, pl. vii. fig. 12.
Teracolus immaculatus, Swinhoe, P. Z. S. 1884, p. 443.
Teracolus subroseus, Swinhoe, *t. c.* pl. xl. figs. 6, 7.
Teracolus alberta, Swinhoe, Ann. & Mag. Nat. Hist. ser. 6, vol. v. p. 356 (1890).

Appears to range from Karachi to Bushire; and one male in the British Museum series is said to have been obtained at Aden, but this I consider very doubtful.

As I do not admit the identity of *T. pseudacaste* with *T. eupompe*, still less can I agree to this purely Asiatic species being the same. As a rule, it may be distinguished at a glance by its narrower and internally arched apical carmine patch, but occasionally a male with a fairly broad patch does occur, though I believe never a female. Another point is that *T. dulcis* has the base of the primaries below

more or less washed with sulphur-yellow, whereas *T. eupompe* and *T. pseudacaste* are uniformly pure white; the veins below are sometimes black-tipped, but never black throughout, and, as already hinted, the apical patch is carmine, with a faint lilac shot rather than crimson. The females vary much in the colouring of the apex in all three species.

The wet-season form is represented by *T. dirus* (=*eboreoides*); *T. immaculatus* is a variety of the same approaching *T. eupompe* in the partial obliteration of the spots on the under surface, although differing in the colouring of the apical patch and sulphur tinting at base of primaries below; *T. dulcis* is a starved wet-season form, *T. alberta* the dry-season form, and *T. subroseus* a starved dry-season form or the dry form of the dwarfed *T. dulcis*.

73. *Teracolus Danae*.

Papilio Danae, Fabricius, Syst. Ent. p. 476 (1775).
Papilio eborea ♀, Cramer, Pap. Exot. iv. pl. cclii. E, F (1782).
Teracolus sanguinalis, Butler, P. Z. S. 1876, p. 158.
Teracolus Taplini, Swinhoe, P. Z. S. 1884, p. 444, pl. xl. figs. 8, 9.

Ranges throughout Wallace's Ceylonese subregion—that is to say, from Bombay to Madras and Ceylon.

This species is in some respects nearer to the African *T. pseudacaste* than to *T. dulcis*, there being no sulphur-yellow at the base of the primaries on the under surface of the males and the carmine apical patch being distinctly broader than in the latter species in both sexes; the heavy continuous black bordering to the secondaries in the wet-season form is characteristic of *T. Danae*, whilst even in the males of the dry-season form it is far more heavy than in the allied species. *T. Danae* is the wet phase, *T. sanguinalis* is intermediate, and *T. Taplini* dry, the last-mentioned having the usual rosy under-surface coloration.

74. *Teracolus fausta*.

Papilio fausta, Olivier, Voy. l'Emp. Oth. Atl. pl. xxxiii. figs. 4 *a*, *b* (1801).
Idmais faustina, Felder, Reise der Nov., Lep. ii. p. 190 (1865).
Teracolus rosaceus, Butler, P. Z. S. 1876, p. 134, pl. vii. fig. 6.
Teracolus oriens, Butler, *t. c.* fig. 7.
Teracolus solaris, Swinhoe (nec Butler), P. Z. S. 1884, p. 437, pl. xxxix. fig. 5.

The range of *T. fausta* appears to be from Syria and the Turko-Persian frontier, through Afghanistan, into North-western India, where it becomes slightly modified and exhibits fairly well-marked seasonal variation. The true *T. fausta*

has a dry-season upperside and the male has a dry-season underside; but the underside of the female exhibits wet-season characters on the lower surface of the wings. The nearest approach to a wet-season form of *T. fausta* is represented by a pair received from Fao, barely distinguishable from the male of my *T. oriens*.

T. solaris of Swinhoe (and formerly of the Museum series), = *T. oriens* (part.), Butler, is the true wet-season form of India, and *T. rosaceus* the dry-season form; but so intimately is this connected with *T. faustina* and *fausta* through the Persian examples above referred to, that it cannot be regarded as a distinct species, but can only be spoken of as the Indian development of *T. fausta*; even as a race it could only be arbitrarily separated by restricting it to Indian examples. On the other hand, Mr. Marshall's action in placing the Arabian *T. vi* as a synonym of *T. fausta* shows want of care, or, perhaps, of discernment, in noting its entirely different wing-outline.

75. *Teracolus vi.*

Teracolus vi, Swinhoe, P. Z. S. 1884, p. 437, pl. xxx. figs. 6, 7.

Aden, Arabia.

This species is allied to *T. fausta*, to which it bears a general resemblance; it, however, differs in its shorter, broader wings, with more arched outer margin, in the much yellower tint of the under surface, from which the discocellular spots have almost wholly disappeared, whereas the discal markings, though soft and blurred, are distinctly discernible both in primaries and secondaries. *T. vi* is undoubtedly a dry-season form which has no other phases, and is as distinct a species from *T. fausta* as are *T. fulvia* and *T. tripunctatus*.

76. *Teracolus fulvia.*

Idmais fulvia, Wallace, Trans. Ent. Soc. 1867, p. 392, pl. ix. fig. 5.
Teracolus solaris, Butler, P. Z. S. 1876, p. 135.
Teracolus Palliseri, Butler, Ann. & Mag. Nat. Hist. ser. 6, vol. i. p. 418 (1888).

Khandesh, S.W. India. The type, in the Museum collection, is said to be from Scinde, but this is probably an error. Mr. Marshall has confounded *T. solaris* with *T. fausta* and *T. fulvia* with *T. tripunctata*; but all are easily separable. *T. solaris* is simply *T. fulvia*, being based upon Wallace's type of that species.

77. *Teracolus tripunctatus.*

♂. *Teracolus tripuncta*, Butler, P. Z. S. 1868, p. 221, pl. xvii. fig. 9.
♀. *Teracolus tripunctatus*, Butler, P. Z. S. 1880, p. 149, pl. xv. fig. 4.
Teracolus surya, Moore, Journ. As. Soc. Beng. lii. p. 45 (1885).

Probably occurs over the greater part of South India and at Trincomali in Ceylon. It is readily separable, both in its wet- and dry-season forms, from *T. fulvia* by the much blacker apical patch on the primaries enclosing three isolated spots of the ground-colour, instead of being divided by a belt of spots; the marginal spotting of the secondaries is also much heavier than in *T. fulvia* and the under surface of the dry-season form yellower and less rosy. We have fifteen examples in the Museum from Bombay and the Nilgiris on the west and from Ganjam and Ceylon on the east.

78. *Teracolus celimene.*

Anthocharis celimene, Lucas, Rev. et Mag. de Zool. p. 426 (1852).
Anthocharis amina, Hewitson, Exot. Butt. iii., *Anth.* pl. i. figs. 1–3 (1866).

Appears to range from Abyssinia to Swaziland, whence we have a dry-season male obtained by Mr. Buxton.

I cannot believe that *Anthopsyche pholoe* of Wallengren is identical with *T. celimene*; the description reads like that of a female, but does not agree with the female in the Hewitson collection. We have the typical wet-season form of male *T. celimene* from Lake Nyasa (G. & S. coll.); therefore Mr. Marshall's suggestion that the western *T. pholoe* is the dry-season form of the eastern *T. celimene* (of which we already have both wet and dry forms) seems far-fetched.

79. *Teracolus pholoe.*

Anthopsyche pholoe, Wallengren, Wien. ent. Mon. iv. p. 35 (1860).
Anthocharis phœnon, Trimen, Trans. Ent. Soc. iii. 1, p. 522 (1863).

The range of this species, so far as at present known, is from Damaraland eastward to Lake Ngami. It seems probable that Wallengren described the female and Trimen the male; the two series of red spots upon which my friend relies as disproving the female character of *T. pholoe* are the chief evidence in its favour, for, as Trimen himself shows, the males of this group of *Teracolus* have the apical patch *purplish lake, violet-glossed* and *intersected* by a black streak, not, as Wallengren says, *black, with violet-glossed red spots in two rows.* The female of *T. præclarus* gives an indication of such a character, but has the marginal spots also red instead of yellow.

80. *Teracolus præclarus.*

Teracolus præclarus, Butler, P. Z. S. 1885, p. 769, pl. xlvii. fig. 7.

Somaliland.

This beautiful species is evidently a link between *T. pholoe* and *T. zoe*, although the latter is in many respects more nearly related to the *T. halimede* group. It is probable that other species of the *T. celimene* type still remain to be discovered. *T. præclarus* appears to be a dry-season form.

81. *Teracolus zoe.*

Anthocharis zoe, Grandidier, Rev. et Mag. de Zool. p. 272 (1867); Mabille, in Grand. Madag. pl. xl. figs. 3–5.

Madagascar.

In the ash-grey base and black veins to the primaries and orange costal stripe to the secondaries this species approaches *T. leo*. In other respects it is nearer to *T. præclarus*.

82. *Teracolus leo.*

Anthocharis leo, Butler, Ann. & Mag. Nat. Hist. ser. 3, vol. xvi. p. 397 (1865).

Appears to be confined to North-eastern Africa, from the White Nile to Somaliland, and southward as far as Kilimanjaro.

It is readily distinguishable from *T. halimede* by the orange patch on the primaries being restricted to below the first median branch and the outer dusky border only represented, even in the wet-season examples, by spots. The type of the species is, in my opinion, an intermediate form between the wet and dry phases. I have not yet seen what I should regard as an undoubted dry-season form, unless it be represented by a small example from Mr. Druce's collection (G. & S. coll.) in which the orange is carried a little above the first median branch, the base somewhat glistening and white, and the apical markings weak as in typical *T. leo*. This specimen is without locality.

83. *Teracolus halimede.*

Pontia halimede, Klug, Symb. Phys., Ins. pl. vii. figs. 12–15 (1829).
Pontia acaste, id. *l. c.* figs. 16, 17 (1829).
Pieris polycaste, Boisduval, Sp. Gén. Lép. i. p. 525 (1836).
Teracolus cœlestis, Swinhoe, P. Z. S. 1884, p. 435, pl. xxxix. figs. 1, 2 (1884).

Confined to Arabia.

T. acaste represents the wet-season phase, *T. halimede* the intermediate, and *T. cœlestis* the dry-season phase of the species; but they are none of them confined to seasons, but occur (as is the case with other species in very arid countries) as mere coexistent variations. If the species could be transferred to a variable climate, doubtless the varieties would become strictly seasonal forms, as is the case with other species of *Teracolus*. Our series of this species is very fine.

84. *Teracolus venosus.*

♂. *Idmais venosa*, Staudinger, Exot. Schmett. p. 43, pl. xxiii. (1885); ♀, Holland, Proc. U.S. Nat. Mus. vol. xviii. p. 759 (1896).

Mombasa.

This is a wet-season form somewhat resembling *T. acaste*, but entirely without the orange flush on the upper surface of the wings. It would not surprise me to find that in the dry season the male had a tint of orange and that the female resembled a washed-out *T. cœlestis*. However, this is mere conjecture. Mr. Marshall says that *T. venosus* comes closest to the *halimede* group. I would go a step further and say that it belongs to that group, for it differs in nothing but the absence of orange colouring.

85. *Teracolus heliocaustus.*

Teracolus heliocaustus, Butler, P. Z. S. 1885, p. 768, pl. xlvii. figs. 8, 9.

Somaliland.

Intermediate between *T. halimede* and *T. pleione*, being a little nearer to the latter, which it represents on the Somali coast. It is a dry-season form, varying much in the black markings of the upper surface.

86. *Teracolus pleione.*

Pontia pleione, Klug, Symb. Phys., Ins. pl. viii. figs. 7, 8 (1829).
Idmais miriam, Felder, Reise der Nov., Lep. ii. p. 190, pl. xxvii. figs. 3, 4 (1865).
Teracolus chrysomelis, Butler, Cist. Ent. i. p. 244 (1874).
Idmais eucheria, Mabille, Bull. Soc. Ent. Fr. (5) ix. p. clxxiv (1879); Grand. Madag. pl. xi. fig. 5 (1887).

White Nile and Arabia.

T. miriam (=*chrysomelis*) is the dry-season phase of *T. pleione*; but in Arabia both forms occur as mere varieties simultaneously and emerge on the same day from the same batch of pupæ. It would be interesting to know whether the forms are seasonally constant on the White Nile.

87. *Teracolus gaudens.*

Teracolus gaudens, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 486 (1876).

Abyssinia.

The type is a wet-season male, and for some time I held Mr. Marshall's opinion, that *T. arenicolens* from Arabia was clearly its dry-season form. This, however, I have now proved to be an error, based upon a false identification of *T. chrysonome*—an Arabian species and distinct from the Somali insect.

88. *Teracolus chrysonome.*

Pontia chrysonome, Klug, Symb. Phys., Ins. pl. vii. figs. 9–11 (1829).
Teracolus arenicolens, Butler, Ent. Month. Mag. xxi. p. 81 (1884).

Arabia and Nubia.

In the Godman and Salvin collection were four examples of typical *T. chrysonome* (received from Mr. Druce, who purchased them from the Kaden collection); these correspond closely with Klug's figures, and are undoubtedly the wet-season form of *T. arenicolens*. They differ from my supposed *T. chrysonome* from Somaliland in the much less defined markings upon an opaque pale sulphur ground on the under surface, and on the upper surface in the slightly more slender and sometimes imperfect blackish irregular stripe across the primaries; the males also with the basal white area chalky, much less suffused with ash-grey, and extending to the end of the discoidal cell.

89. *Teracolus helvolus.*

Teracolus chrysonome, Butler (not Klug), P. Z. S. 1885, p. 768.
Teracolus helvolus, Butler, P. Z. S. 1888, p. 94.

Somaliland southward to Mombasa and Kilima-njaro.

T. helvolus is the dry-season phase of the species; but it is doubtful whether it does not appear simultaneously with the wet-season phase. Our Somali specimens, however, were not taken together, the dry form having occurred in January and the wet form in April.

90. *Teracolus aurigineus.*

Teracolus aurigineus, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. xii. p. 103 (1883).
Teracolus venustus, Butler, P. Z. S. 1888, p. 94.

From the Albert Nyanza eastwards to Mount Kenia, the Victoria Nyanza, and Kilima-njaro, and southwards to Nyasa.

We have a very fine series of wet-, intermediate, and dry-season examples of this species. *T. aurigineus* represents the wet and *T. venustus* the dry phase.

Race? *Teracolus Ansorgei.*

Teracolus Ansorgei, Marshall, P. Z. S. 1897, p. 13.

Somaliland.

Chiefly differs from *T. aurigineus* in the absence of the ashy whitish base to the primaries of the male; but, if examples from Gallaland are referable to the same species, this character must be variable.

91. *Teracolus Doubledayi.*

Idmais Doubledayi, Hopffer, Peters's Reise n. Mossamb., Zool. v. p. 363 (1862).
Idmais Hewitsoni, Kirby, Cat. Diurn. Lep. p. 498 (1871).
Idmais chrysonome, Doubleday and Hewitson (not Klug), Gen. Diurn. Lep. pl. vii. fig. 5 (1847).

Congo, Angola.

The dry-season form is small and suffused with vinous over the darker markings of the under surface, the bands across the secondaries being vinous brown instead of golden orange or cadmium-yellow.

92. *Teracolus rhodesinus.*

Teracolus rhodesinus, Butler, P. Z. S. 1893, p. 663.

Lake Mweru, Central Africa

I have only seen the type of this species (a wet-season male), but it is so markedly distinct from the allied *T. mutans* that I cannot for a moment entertain the notion of its being a form of that species. It differs not only in the slender discal band across the upper surface (which is partly obliterated), but in the creamy ochreous tint of the upper surface extending inwards almost to the base of the secondaries, in the paler sulphur tint of the apex of primaries and the secondaries on the under surface, as also in the strongly defined and more parallel inner angular band across the latter wings. In some of these characters it more nearly approaches *T. aurigineus.*

Mr. Marshall asserts that this butterfly combines the characters of *T. Hanningtoni* and *mutans*! I fail to see where *T. Hanningtoni* comes in.

93. *Teracolus mutans.*

Teracolus vesta, Trimen (not Reiche), South Afr. Butt. vol. iii. p. 160 (1889).
Teracolus mutans, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xix. p. 459 (1877).
Teracolus argillaceus, Butler, *ibid.* (and *T. vesta*, Staudinger, Exot. Schmett. i. pl. xxiii., 1884).

Ranges from Nyasa southwards to Natal, occurring on the Zambesi, in the Transvaal, and at Delagoa Bay.

After examining twenty-nine examples of this species, including some interesting varieties recently collected by Mr. Guy A. K. Marshall, I am unable to follow that gentleman in his decision as to the identity of the southern insect with the Abyssinian *T. vesta*; the latter, judging from the descriptions and the original illustration, is slightly larger and differs in the salmon-buff of the upper surface extending in the cell of primaries right up to the almost black basal suffusion, in the even heavier black border of the secondaries and the yellow suffusion on the interno-median area, in the less irregular and uniformly redder bands on the under surface of the secondaries, the inner and submarginal bands being also broadly and sharply defined. Most examples of *T. mutans* show very little blackish suffusion at the base of the wings on the upper surface; but Mr. Marshall, who seems to be one of the most energetic and indefatigable of collectors, has sent us several unusually heavily shaded examples, in which the basal suffusion is deep bluish ash-coloured, but far from approaching the grey-blackish tint of typical *T. vesta*. The more southern examples of *T. mutans* are considerably smaller than the Abyssinian species, but the Nyasa examples sometimes run it very close in expanse of wings.

T. argillaceus is the dry-season form of the species, and we have some very pretty intermediate examples from Delagoa Bay and Nyasa.

94. *Teracolus vesta.*

Idmais vesta, Reiche, in Ferr. Gal. Voy. Abyss., Ent. p. 463, pl. xxxi. figs. 7, 8 (1849).
Idmais velleda, Lucas, Rev. et Mag. de Zool. 1852, p. 428.

Abyssinia.

Both descriptions and the illustration of this species are taken from the wet-season form. Reiche's figures apparently represent a female. It is probable that the male will prove to be less black at the base of the wings above.

95. *Teracolus catachrysops.*

Teracolus catachrysops, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. ii. p. 178 (1878).

East Africa, from the Sabaki valley southwards to Masasi.

The wet form alone of this species has hitherto been received. It is readily separable from *T. mutans* and *vesta* in the small size of the submarginal spots on the black external area, and in the white colour of these spots on the secondaries of the female; from *T. mutans* also in the greater distinction of tint between the orange ground-colour and yellow apical and external spots on the under surface of the primaries and the deep red bands on the under surface of the secondaries, and from *T. vesta* in the straighter character of these bands and the slenderness of the innermost one.

A female from the Sabaki valley has the ground-colour above entirely white, feebly tinted with sulphur-yellow, and the colouring below paler than usual.

96. *Teracolus Hanningtoni.*

♂ ♀. *Teracolus Hanningtoni*, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. xii. p. 104 (1883).

♀. *Teracolus bipartitus*, Rothschild, Novit. Zool. i. p. 537 (1894).

From the Victoria Nyanza eastward to Witu.

This species may be distinguished at a glance from its nearest ally *T. catachrysops* by the minute discocellular spot on the primaries, the more tapering series of spots on the black external area of the secondaries, the minute subapical spots on the primaries, the yellower discal colouring on the under surface of these wings, and the dark veining of the same surface of the secondaries. Mr. Marshall states that Mr. Jackson's series shows the impossibility of separating these two species; but I have often been told similar things about other butterflies, and am not inclined to accept any such observation on trust, especially from a man who, though a good observer, sees no difference between the illustration of *T. vesta* and *T. mutans*, but speaks of both as "typical specimens" *.

97. *Teracolus amelia.*

Idmais amelia, Lucas, Rev. et Mag. de Zool. 1852, p. 428.

Abyssinia.

Although more nearly related to *T. Hanningtoni* than to

* I have recently examined Mr. Jackson's series, and had no difficulty whatever in assigning them to their proper species.

any other species of the group, this butterfly differs from all in the much greater restriction of the ochreous colouring on the primaries of the male (which commences beyond the end of the cell), in the entirely different coloration of the under surface, the primaries being saffron-yellow on basal two fifths, very pale creamy yellow on the disk, and with the dark bands golden olive or yellow-brown, the two outer bands on the secondaries near together and arched rather than angulated (as in *T. vesta* as compared with *T. mutans*). From all the species excepting *T. Hanningtoni* it differs in the minute discocellular spot on the primaries. Only the wet-season form is known at present either of *T. Hanningtoni* or of this species.

98. *Teracolus protomedia.*

Pontia protomedia, Klug, Symb. Phys., Ins. pl. viii. figs. 13, 14 (1829).

Ranges from the Albert Nyanza northward to Abyssinia and eastward through Somaliland to Arabia.

It is closely related to the preceding species and especially to *T. Hanningtoni*, but its superior size, bright uniform yellow colouring, black-veined primaries, less banded upper surface of secondaries, and lack of a subbasal band on the under surface of these wings, have saved its being regarded as a variety of *T. vesta*. These differences, though perhaps not greater than exist between *T. amelia* and *T. mutans*, are more readily grasped without effort.

The seasonal differences are well defined, the wet-season phase having the chief markings below smoky brown, partly veined with saffron-yellow; the intermediate form has these markings redder and with well-defined veining; the dry phase has them almost wholly bright reddish orange. At Aden all three types occur together as mere variations.

LIX.—*On the Tetrameric Regeneration of the Tarsus in* Phasmidæ. By Edmond Bordage *.

At the meeting held on January 25 last I had the honour to communicate to the Académie des Sciences a few of the principal results that I had obtained previously with reference to the phenomena of autotomy in Phasmidæ †. In conclusion I spoke of the process of regeneration of the ampu-

* From the 'Comptes Rendus,' t. cxxiv. no. 26 (June 28, 1897), pp. 1536–1538: from a separate impression communicated by the Author.

† *Vide suprà*, pp. 473, 476.